REMARKS ON THE SUPPLY OF WATER

TO THE METROPOLIS;

WITH

AN ACCOUNT OF THE NATURAL HISTORY OF WATER

IN ITS SIMPLE AND COMBINED STATES;

AND OF THE

CHEMICAL COMPOSITION AND MEDICAL USES

OF ALL THE KNOWN

MINERAL WATERS;

BEING

A GUIDE TO FOREIGN AND BRITISH WATERING PLACES.

BY

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REMARKS ON THE SUPPLY OF WATER

TO THE METROPOLIS.

Public attention has at length been aroused to the means of supplying this vast Metropolis with Water—a fluid so important to human existence. This has been effected by the highly meritorious exertions of an individual*. An anonymous pamphlet appeared, styled The Dolphin, a name adopted by one of the Companies which supplies the Western part of the town with water, which so exposed the contaminated state of the fluid supplied, that a meeting of all the rank and respectable inhabitants of that district took place, who, among other things, resolved, "That the water taken up from the river Thames at Chelsea," the site of the Dolphin, "for the use of the inhabitants of the Western portion of the Metropolis being charged with the contents of the great common sewers," and others, perhaps 10,000 in number, "the Drainings from Dunghills and Laystalls, the Refuse of Hospitals, Slaughter houses, Colour, Lead and Soap Works, Drug mills and Manufactories, and with all sorts of decomposed animal and vegetable substances, rendering the said water offensive, and destructive to health, ought no longer to be taken up by any of the Water Companies from so foul a source;"—that the water was pronounced by professional men of the first eminence to be "a filthy fluid, loaded with decayed vegetable matter, and other substances equally deleterious to health, and unfit for domestic purposes." A petition was presented to both Houses of Parliament, praying that a Commission should be appointed by His Majesty, "to inquire into the Supply of Water in the Western part of the Metropolis;" which Commission was granted. The Commissioners summoned a vast number of witnesses, and drew up a Report on the evidence, which extended to 154 folio pages; the substance of which was a perfect confirmation of the allegations of the petitioners, as to the impurity of the water supplied to the Metropolis, but that there was an abundant supply. This Report was submitted to Parliament; but the Right Hon. R. Peel, His Majesty's Secretary of State for the Home Department, was of opinion, as the supply was abundant, that the Government ought not to take up the subject, but leave it in the hands of the public. This is the most remarkable instance of the apathy or inattention of that great improver of abuses, to the public interests. Posterity

* Mr. Wright, of Regent Street.

will scarcely credit, that a statesman, who has effected so many invaluable legal improvements, could have excluded from his consideration a subject of such vital importance to every human being in this mighty metropolis. The public at large, however, are unanimous in their decided intention, of renewing their application to the legislature, which sooner or later, must comply with the just and reasonable prayer of their petitions. It appears from the Report of the Commissioners, that a parallel instance of gross impurity and filthiness, in the supply of water to the inhabitants of a large city, cannot be equalled in any other part of the globe. Different specimens of the water supplied—of that fluid which enters into the composition of animals and vegetables, and so powerfully and extensively assists the evolutions of the solids, and composes the greater part of the fluids in the human body, were examined by the most eminent medical men, and analysed by our most distinguished chemists, who unanimously declared, "that such specimens were loaded with a great quantity of filth, which renders such water disgusting to the senses, and improper to be employed in the preparation of food." Surely such a monstrous evil requires a remedy. The fluid, which is the vehicle of human food and nourishment, must have a constant and powerful agency on the animal machine at all times—a constant and regular operation on the human body; and hence the great necessity of the purity and salubrity of that fluid. So great has been the deterioration of the water in the Thames, that fish can no longer live in certain parts of the river; and that they cannot be preserved in such water for any length of time after removal.

The principal causes of the impure and deteriorated state of the water of the Thames, which supplies a very considerable part of the capital, are the refuse of animal and vegetable matters, which are now allowed to flow into the common sewers, and thence into the river; the refuse of the coal gas, which pollutes the river in many parts; the quantity of dead animals constantly thrown into the water; the refuse of slaughter houses, and the hideous and abominable exuviæ of one million of inhabitants. Such are the ingredients that are dissolved, mechanically suspended, or chemically combined, in the water which supplies the Western, the most influential and fashionable part of the British capital.

It appears from the Report of the Commissioners, that the water of the New River is by far the purest source of supply, and that it occasionally derives only a small quantity from the Thames—when there is a severe frost, or great drought. "The New River and Hampstead waters," says Dr. James Johnson, "are ethereal streams, compared with those of Chelsea." The Commissioners also acknowledge the superiority, but observe "there is still room for improvement." The Commissioners, as if anxious to please all parties, the public at one time, and the water companies at another—and perhaps may fail in pleasing either—assert that the water may be filtered in the beds of sand in the river; but if the matters be in solution, or chemically combined, that filtration cannot be perfect, as the water

can be only partially purified. They obtained specimens of the water at its average state, and after a fall of rain, and from that district where it is said to have been impregnated with copper derived from the bottoms of the ships. I have already stated the result of chemical analysis, namely, "that all the specimens being loaded with filth, which renders the water disgusting to the senses, and improper for the preparation of food;" and I may add, "that it contained no copper." Yet the able chemist, Dr. Bostock, asserts, "that the greatest part, if not the whole, of the extraneous matters may be removed by filtration." The Commissioners are of opinion, that if the quality of the water which supplies the capital be objectionable, any remedy of a local nature will be comparatively unimportant. On the whole, they observe that the supply is capable of, and requires improvement. They do not sanction any of the proposed plans of improvement, as their time would not allow them to investigate the subject fully; and their earnest hope is, that its full investigation, by competent persons, will not long be deferred; and that the supply ought not to be left to the discretion of the Companies, and that their proceedings should be subjected to some effective superintendence and controul.

What are the remedies best calculated to obviate the present defects? They consist of three, namely, the conveyance of pure water from ten or twenty miles distance to the metropolis; and to destroy the monopoly which so glaringly exists; or to sink wells, or fountains. The city of Edinburgh was once situated as London now is, but excellent water was soon discovered, and conveyed a distance of ten or twelve miles. And cannot such an example be followed by the most wealthy and populous city in the world? All will admit that such an undertaking would be most readily accomplished. The Thames water might be dispensed with altogether for internal use. Two centuries ago, Sir Hugh Middleton succeeded in bringing pure water from Hertfordshire to the capital, a distance of forty miles. "What is there," says Mr. Wright, in his interesting and valuable Memoir to the Commissioners, "that should deter the inhabitants of the richest, largest, most populous city in the world, the seat of more opulent nobility and gentry than is to be found in any other metropolis, from attempting one of those mighty efforts, which fix the character of a country, and elevate it in the scale of nations, to remove from that city a *national disgrace*." The day must soon arrive, when these suggestions will be attended to, and an object of such vital importance to the health and lives of nearly a million of inhabitants carried into effect. New pipes and tubes could be laid down, for the sole purpose of conveying pure water, and perfectly disconnected with sewers of any kind; and the present supply should be improved, and be continued for the inferior domestic uses.

68, *Hatton Garden*,
June 13, 1828.

NATURAL HISTORY OF WATER,

IN ITS PURE & COMBINED STATES.

WATER, when pure, is tasteless, colourless, and inodorous: it owes its fluidity to the presence of caloric; its natural state, like that of all other bodies, being solidity. It is composed of 85.7 of oxygen, and 14.3 hydrogen, or one volume of oxygen gas to two of hydrogen. Its weight is assumed as the standard of specific gravity: one cubic foot, at 60° or 30° of barometer, weighs 1000 ounces; or one cubic inch, 252.42 grains. Mr. Dalton is of opinion that water is a binary compound, of one atom of oxygen and one atom of hydrogen; and, adding the weights of these atoms together (7.5 × 1,) an atom of water will weigh 8.5. Water is an essential constituent in the organization of all living bodies, whether animal or vegetable; and it exists, in the solid form, in most of the mineral substances. When most pure, it is a compound, and, from its extensive solvent power, is scarcely to be found in a simple, pure, and uncombined state; for even in every fountain the water is impregnated with saline and earthy substances, which are generally insufficient to change the sensible qualities of the fluid, or to render it unfit for the ordinary purposes of life. If transparent, colourless, inodorous, tasteless, and not liable to spontaneous change, it is called pure. It remains liquid at the common temperature of our atmosphere, and assumes a solid form at 32°, expanding one-tenth with an immense force; and the gaseous at 212°, expanding 2000 times its ordinary bulk; or in vacuo at 90°; returning to its liquid state on resuming any degree of heat between these points. It can sustain the heat of 400° in Papin's digester. This fluid is capable of dissolving a greater number of natural bodies than any other in nature whatsoever; and, when

saturated with one substance, it can take up a portion of a second, third, or fourth ; during which solution a change of temperature takes place; and, when it enters into a state of combination with various solid bodies, it loses its fluidity, and forms hydrates or hydroxures. It is found throughout the earth, not only in its uncombined states of solid, fluid, and gas, but permanently united to a vast number of bodies, whether solid, fluid, or gaseous. It is a most abundant ingredient in animal and vegetable substances. If we examine the embryo state of nature, we shall find much truth in this assertion : the hardest bones of animals were first an aqueous jelly, and the hardest wood was first a drop of viscid water. Watson, in his Chemical Essays, asserts that, if the hardest wood be converted into charcoal, it loses three-fourths of its weight, which is almost entirely pure water ; and that great chemist, Dr. Kirwan, states, " that grass loses, by drying into hay, two-thirds of its weight ; or, if submitted to distillation, affords two-thirds of its weight of pure water."* Dr. Hales proved by experiment, " that a sunflower, weighing three pounds avoirdupois, and watered daily, perspired, or passed through it, twenty-two ounces each day ; nearly half its weight of water." Thus Thales, the Miletian, is tolerably correct, when he denominated water the " omniseminaria," the seminary of all things.

This useful and necessary fluid presents itself to our notice in three distinct forms—namely, in a fluid, gaseous or vaporous, and in a solid or frozen state. It descends in the forms of dew, rain, hail, or snow ; or from the earth, which sends it forth in springs and rivulets. In the former case, the watery exhalations drawn from the sea and surface of the earth by the sun's heat, form clouds, whose particles, being afterwards condensed, fall in showers. In the latter, the water which falls on the tops of mountains, and other lofty situations, penetrates the earth, and, after passing dowwnwards. breaks forth at some fissure or aperture, at a distance from its source,

* Kirwan on Manures.

Water differs according to the source from whence it is derived, as rain, snow, river, ice, well, and fountain water; and also according to the strata through which it passes.

On the Medical Effects and Uses of Water.

The human body is composed of solid and fluid parts, a structure which exists in all animated nature. Water was the first and most natural fluid which was employed by man and animals to afford such fluid particles, and, forming so large a portion of our ingesta, must have a powerful and constant agency on the human body. Thus, when the heat of the body is increased, an aqueous fluid is copiously exhaled through the skin; and, on the evolution of caloric necessarily attendant on its transition from a gaseous to a fluid state, the reduction of temperature principally depends. Insensible perspiration is, perhaps, little else than pure water with a very minute quantity of salt; and the obvious uses of this copious excretion seem to be, not only to remove a superabundance of water from the system, but especially, by carrying it off in a gaseous form, to constitute the great cooling process, and thus keep in proper check the production of heat by the lungs. As an aliment, its use is to hold in solution, and convey in a proper form, the various substances which constitute the solid food of animals. This fluid itself is a very necessary aliment, and is the chief mean of preserving the due proportion of fluid to solid matter, on which the preservation of life and due performance of all the functions depends. It will have different effects on the stomach, according to the different temperatures: thus, at 60° it has little effect; between 45° and 60° produces cold, improves the stomach, and is tonic; below 45°, it produces a greater degree of cold in that organ and all over the body, is astringent and sedative; and between 60° and 80°, it causes nausea, relaxing the fibres of the stomach. Water taken into the intestines dilutes the chyle, and soon acquires the temperature of that fluid. If taken in great quantity, it increases the circulating fluids, induces plethora, apoplexy, dropsy,

and a phlogistic diathesis. Its effects producing plethora and fluidity, are very transitory. It dilutes the contents of the stomach and intestines, often diminishing their acrimony. It acts on the kidneys and skin, and the quantity of secretion will be equal to the quantity taken into the body, though the equilibrium is sometimes destroyed, for the cutaneous exhalation may exceed that of the kidneys, and *vice versâ*.

As a diluent in internal hemorrhages, its temperature should not exceed 45°, while in fevers it may be 60°; except in the cold stage, when the thirst should be allayed by warm water, or some other bland fluids. In the latter complaints, it quenches thirst, reduces heat, and promotes perspiration; and the feelings of the patient afford a good guide whether it should be taken hot or cold. In cholera morbus and dyspepsia, where acrid matter exists in the primæ viæ, water is naturally desired. If taken when the body is overheated, it may cause inflammation of the stomach, which will speedily be followed by gangrene, or death; and this by the abstraction of caloric,—an effect which will be prevented by keeping up, or increasing, the temperature of the body after the application of the cold.

When the ingredients are such as change the sensible and physical qualities of water, it is called a *mineral* water. It requires an intimate knowledge of the action of bodies on each other, and the utmost nicety in the manipulations, to analyze them; the quantity of water on which the chemist has to operate being so minute. The substances found in mineral waters may be divided into, the gaseous, the acids, the alkalies, the earths, the compound salts, and the metals. It embraces the whole range of natural bodies. Thus we have, atmospheric air; oxygen, nitrogen and carbonic acid gas; sulphurous acid; sulphuretted hydrogen; boracic; nitrous and muriatic acids; soda; lime; silicia; sulphuric, nitric, muriatic and carbonic acids; sulphates of soda, of lime, of magnesia, of iron, of copper, and of alum; nitrates of potass, of lime, and of magnesia; muriates of potass and of soda;

muriates of ammonia, of lime and magnesia, of barytes and alumina, and of magnesia; carbonates of potass, of soda, of ammonia, of lime, of magnesia, of alumina, and of iron; and hydrosulphurets of soda and of lime.

Chemical Composition and Medical Uses of all the known Mineral Waters.

Abcourt, St. Germain's, France, is diuretic and aperient, and used in dropsy, jaundice, visceral obstructions and eruptions.

Aberbrothick, Scotland; a carbonated chalybeate, used in dyspepsia.

Acton, Middlesex, coutains sulphate of magnesia and muriate of soda.

Aix-la-Chapelle, Germany, contains carbonate of lime, muriate and carbonate of soda, and sulphur; is diaphoretic and purgative, and has been used in heartburn, asthma, ague, excessive menstruation; externally, in rheumatism, palsy, tremors, contractions, tumours and cutaneous diseases.

Aix, in Provence; used in piles, diseases of the kidney and bladder, in fluor albus; is somewhat similar to Plombieres.

Albermarle, or Aumale, Rouen; contains carbonate of iron.

Alford, Somersetshire; is saline, and strongly purgative.

America, several in the United States.

Alvenan, Switzerland, is famous for bathing.

Arkansaw river, Mineral Waters near, from 180° to 190°.

Ashton, Wiltshire, is a carbonated chalybeate water.

Askeron, Yorkshire, is a saline and sulphurous water.

Austria contains mineral waters, at Sellrain, Merain, Sexton, Prax, Agums, Brutz, Rabi, Pci, Stiria, Carinthia and Carniola.

Baden, Germany, is a hot sulphurous water, like Aix-la-Chapelle.

Baia, Italy, is a strong sulphurous water.

Balemore, Worcester, contains carbonate of iron; is strongly tonic.

Balaruc, near Montpellier, is employed in jaundice, palsy, scrofula, in diseases of the kidney; and externally in cutaneous affections.

Ballyspellan, Johnstown, Kilkenny, is greatly esteemed in dyspepsia, chlorosis, lowness of spirits and visceral obstructions. It is justly esteemed, and much frequented.

Bagneres, Upper Pyrenees; similar to Aix-la-Chapelle.

Bagnols, Guard, France, is a tepid sulphurous water, and used in phthisis, affections of kidney, psora, palsy and rickets.

Ballston, New York; a sulphurous water; a chalybeate there; the waters highly prized, and exported to Europe. There are numerous other chalybeates in its vicinity.

Bandola, Italy, aperient, diaphoretic and diuretic.

Barèges, France, Pyrenees, similar to Bath. It has been used in nervous, œdematous and cutaneous affections; in visceral obstructions, in rheumatism, chlorosis and consumption; is aperient and diuretic.

Barnet, Herts, contains sulphate of magnesia and carbonate of lime.

Barrowdale, Cumberland, contains muriate of soda in great quantity, and carbonate of lime.

Bath, Somersetshire, contains carbonic acid, nitrogen gas, sulphate and muriate of soda, silceous earth, selenite, carbonate of lime, and oxide of iron; temperature, 112° to 116°. It is diuretic, sudorific and aperient; but may induce constipation and stupor. It has been employed in diseases of the stomach, liver, bowels; in gout, rheumatism and partial paralysis; in chlorosis, and, according to the excellent Treatise of Dr. Barlow, in chronic eruptions.

Bedford, in Pennsylvania, United States, is a sulphurous water.

Bologne, near Calais, contains carbonate of iron.

Bonnes, Lower Pyrences, similar to Barèges; temperature, 102°.

Bourbon l'Archambaud, near Moulins, is saline, and has been used in diseases of liver, jaundice, bowel affections and apoplexy.

Bourbon Lancy, is aperient, diuretic and emmenagogue; has been used in cachexia, diarrhœa, fluor albus, œdema and asthma. Externally, in palsy, tremors, rheumatism and cutaneous affections.

Bourbonne, France, is a warm, saline and sulphurous water.

Borset, near Aix-la-Chapelle, a warm, alkaline and sulphurous water; 130°.

Brentwood, Essex, is a saline aperient water.

Brighton, a chalybeate. Patronized by His Most Gracious Majesty. Waters similar to those of the German Spa prepared here.

Bristol, Somersetshire, contains lime, muriate of soda, sulphate of magnesia and selenite. It has been considered as specific in consumption; allays hectic; is used in bilious diarrhœa, dysentery, diabetes, calculous and cancerous disorders, and fluor albus.

Bromley, Kent, is diuretic and corroborative.

Broughton, Yorkshire, similar to Harrowgate.

Brownstown, Kilkenny, used with advantage in stomach, liver or other visceral diseases; in calculous and uterine disorders, and worms.

Buda, in Hungary, is famed for its excellent baths.

Buncombe county, North Carolina, waters of; much visited.

Buxton, Derbyshire; temperature, 82°; is praised in gout and rheumatism, and in diseases where bathing is useful.

Buzot, Spain, is a warm chalybeate water.

Caldas, Portugal; used successfully in chronic, rheumatism and dyspepsia; also much famed for bathing.

Calabria, Italy, contains sulphate of soda.

Carlsbad, Bohemia; used in scrofula, dyspepsia, &c. in baths.

Cartmel, Lancashire, contains muriate of soda and Epsom salts.

Castlecomer, Kilkenny, situated in the beautiful and classic demesne of the Dowager Countess of Ormond and Ossory. It was analysed by the late Professor Higgins, of the Royal Dublin Society, and was found to contain iron, carbonic acid, and muriate of soda; and Drs. Wade, Garnet and M. Ryan, thought it one of the best chalybeates in Ireland.

Castleconnel, Limerick; a strong chalybeate, and is much frequented, and highly esteemed, for its excellent properties.

Castleleod, Scotland, a saline and sulphurous water.

Cawley, Derbyshire, contains sulphate of magnesia, and sulphate of lime, a saline and calcareous water.

Cawthorp, Lincolnshire, is aperient and antacid.

Cauteres, Upper Pyrenees, near Bagneres; temperature, 102° to to 120o. Is much praised in acidity of the stomach, asthma, consumption, suppression of the menses, and cutaneous affections.

Chadlington, Oxfordshire, is an aperient.

Chaude Fontaine, Germany; same as Aix-la-Chapelle.

Cheltenham, Gloucestershire, is aperient and tonic, and much used in dyspepsia, bilious complaints, scurvy and gravel.

Chippenham, Wiltshire, contains carbonate of iron.

Cleves, Germany, contains carbonic acid and carbonate of iron.

Clifton, Oxfordshire, near Bristol, to which it is similar.

Cobham, Surrey, contains iron and purging salt.

Codsalwood, Staffordshire, resembles Askeron water.

Colchester, Essex, a saline and sulphurous water.

Cork county contains many mineral waters of minor note,—(see my "Treatise on the Mineral Waters of Ireland," 1824, Longman and Co.)—not given in this account.

Corstorphine, Scotland, contains sulphur and sulphate of magnesia.

Coventry, Warwickshire, contains carbonate of iron and purging salt.

Cransac, Aveiron, contains carbonate of iron and sulphur.

Daswild Bad, Germany; used in visceral diseases.

Dax, near Bayonne, similar to Aix-la-Chapelle; discharges 543 cubic feet of water in 15 minutes; is exhibited in affections of the kidney, in asthma, palsy and rheumatism, also used in baths.

Deddington, Oxford, greatly praised in cutaneous diseases.

Derby, contains carbonate of iron.

Digne, Lower Alps, is used in dyspepsia, scrofula, asthma, visceral obstructions and eruptions.

Dog and Duck, London, a cooling purgative.

Drigwell, Cumberland, similar to Deddington.

Driburgin, Westphalia, a saline chalybeate.

Droppingwell, Yorkshire, is astringent and tonic.

Dudley, Worcestershire, sulphurous and chalybeate.

Dublin salt springs, Francis street and Hanover lane waters.

Dulwich, Kent, contains muriate of soda and sulphate of magnesia.

Dunse, Scotland, contains iron, muriate of soda, and bittern.

Durham, a sulphurous and saline water.

Egra, Bohemia, similar to Cheltenham.

Ems, Germany, famed for sulphurous baths.

Emsem, Germany, properties not described.

Enghien, Netherlands, contains sulphuretted hydrogen.

Epsom, Surrey, contains muriate and sulphate of magnesia.

Fairburn, Rosshire, Scotland, contains sulphur and sulphate of soda.

Fahara, Switzerland, famed for baths.

Felstead, Essex, similar to Islington.

Filah, Yorkshire, is powerfully diuretic and aperient.

Forgés, Rouen, contains carbonate of iron.

Frankfort, Germany, is similar to Harrowgate.
Gainsborough, Lincolnshire, sulphur, iron and Epsom salts.
Geyser, Iceland, contains pure soda.
Germany contains 1000 mineral waters and baths.
Glastonbury, Somersetshire, similar to Clifton.
Glendy, Kincardine, Scotland, similar to Peterhead.
Gran, Hungary, contents of, not described.
Grossal, Germany, a calcareous water.
Haigh, Lancashire, is emetic.
Hampstead, Middlesex, similar to Haigh.
Hanbridge, Lancashire, similar to Scarborough; is less aperient.
Hanleys, Shropshire, contains purging salts; is aperient.
Harrowgate, Yorkshire, contains sulphur, muriate of soda, and purging salt. It is alterative and purgative; destroys worms; is praised in scurvy, scrofula, palsy, and chiefly in cutaneous diseases.
Hartfell, Scotland, is astringent and tonic, and used in all internal hemorrhages.
Hartlepool, Durham, contains sulphur, iron and carbonic acid.
Holt, Wales, is mildly purgative, and used in ulcers and eruptions.
Italy contains many sulphurous and warm springs, of little note.
Joseph's Well, Surrey, contains sulphate of magnesia.
Johnstown; see Ballyspellan.
Ilmington, Warwickshire, contains carbonate of iron and soda.
Inglewhite, Lancashire, a sulphurous chalybeate.
Islington, London, contains carbonate of iron; is tonic and diuretic.
Kedlestone, Derbyshire, is similar to Harrowgate.
Kensington, London, is similar to Acton.
Kilburn, England, a sulphurous and saline water.
Kilkenny College and Canal Spas, sulphurous and chalybeate.
Kinalton, Nottingham, a saline aperient water.
Kincardine, Scotland, similar to Peterhead.
Kingscliff, Northampton, similar to Cheltenham.
Kirby, Westmorland, a saline chalybeate.
Knaresborough; see Droppingwell.
Klintschyselo, Russia, warm springs at.
Knowsley, Lancashire, same as Scarborough.
Kuka, Bohemia, contains carbonate of soda; is diaphoretic.
Lancaster, similar to Tunbridge.
Langeac, Upper Loire, a cold acidulous water.
Latham, Lancashire, similar to Tunbridge.
Lebanon, New Virginia, Albany, a warm spring.
Leuk, Switzerland, not described chemically.
Llandrindad, Wales, a sulphurous chalybeate.
Lucca, Italy, a warm spring.
Lisbeak, Fermanagh, strongly sulphurous.
Leamington, Warwickshire, contains muriate of soda and carbonate of lime; is strongly aperient, and justly much frequented.
Leez, Essex, same as Islington.
Loansbury, Yorkshire, is sulphurous and aperient; used in eruptions.

Madrid, a mineral water there, costains sulphate of soda very largely.

Mallow, Cork, is similar to Bristol. It discharges twenty gallons in the minute; is clear and limpid when drawn from the fountain, with a vapour arising from it. It has the most decided good effects in consumptive habits, even in cases which are considered hopeless.

Malvern, Worcestershire, is tonic and diuretic. It is used in mucopurulent affections of the bladder, in heetic, in consumptive eases, in bilious, female, serofulous and ehronie diseases.

Markshall, Essex, same as Islington.

Maudley, Lancashire, sulphurous and saline.

Matlock, Derbyshire, similar to Bristol; temperature, 66°.

Miers, Franee, aperient and diuretie.

Millar's Spa, Lancashire, same as Tunbridge.

Moffat, Annandale, Seotland, a sulphurous water. Is alterative, diuretie and purgative; is used as a bath.

Mont d'Or, France, same as Aix-la-Chapelle.

Monroe, in Virginia, sweet Springs of, much used.

Montmoreney, Paris, a sulphurous spring.

Mosshouse, Lancashire, same as Islington.

Moreton, Shropshire, similar to Holt.

Motte, near Grenoble, is a warm sulphurous water.

Neville Holt, Lancashire, contains carbonated earth and Epsom salts.

Naphtha, Russia, a chalybeate.

New Cartmel, Lancashire, saline and aperient.

Naples, a sulphurous and chalybeate water, near St. Luke's church.

Newnham Regis, Warwickshire, similar to Scarborough.

Newtondale, Yorkshire, contains carbonate of lime and magnesia.

Nezdeniee, Germany, carbonate of iron and soda; diuretie and tonie.

Nocaria, Italy, famed for baths.

Normanby, Yorshire, is similar to Askeron water.

Nottington, Dorsetshire, sulphurous and saline; used in eruptions.

Ontario, New York, sulphurous.

Oersten, Denmark, little frequented.

Olympian, Kentucky, contains a vast variety of mineral waters.

Orston, Nottingham, a carbonate chalybeate. Induees intoxieation.

Oulton, Norfolk, same as Islington.

Pacolet, South Carolina, a sulphurous water.

Paneras, London, a saline water.

Peterhead, Aberdeen, a strong chalybeate.

Passi, near Paris, similar to Pyrmont and Cransae.

Perekop, Russia, a chalybeate.

Phœnix Park, Dublin, a chalybeate and sulphurous water.

Pisa, Italy, a warm spring; also famed for baths.

Pithkealty, Perthshire, Scotland, a saline water.

Plombieres, France, a saline and sulphurous warm spring; used in affections of bladder and asthma; in scrofula and cutaneous diseases.

Pontgibault, Franee. There are 32 springs here, whose temperatures vary from 82° to 124°; their effeets are diuretie and laxative.

Pongues, Nivernois, France, diuretic and aperient.

Pyrmont, Westphalia; it is diuretic, diaphoretic and aperient; and used in relaxed habits, in cutaneous and nervous, and female diseases, urinary obstructions; and considered the best restorative in broken constitutions.

Prussia, Warmburn; the only mineral water there.

Queen Carmel, Somersetshire, is used in scrofulous affections.

Rykum, Iceland, contains pure soda.

Richmond, Surrey, same as Acton.

Rippon, Yorkshire, sulphurous and saline.

Riviera de Abajo, Spain, near Oviedo; similar to Bath.

Road, Wiltshire, a sulphurous and chalybeate water; very strong.

Saragola, New York, a chalybeate; exported to Europe.

Scarborough, Yorkshire, is diuretic and purgative.

Scolliensis, Switzerland, contains iron, carbonate of soda, and carbonic acid.

Schooley's Mountain, New Jersey, a chalybeate.

Sea water contains muriate soda, muriate magnesia, and selenite.

Sedlitz, Bohemia, contains sulphate of magnesia, and is strongly purgative; is used in stomach, nervous, hemorrhoidal and œdematous complaints, and in anomalous cases succeeding cessation of the menses.

Seltzer, Germany, contains carbonic acid, carbonate of soda, calcareous earth, and magnesia; is used in gravel, scurvy, scrofula, dyspepsia, heartburn, acidity, and in bilious and calculous disorders.

Sene, or Sende, Wiltshire, is similar to Islington.

Scydschutz, Germany, same as Sedlitz.

Shadwell, London, contains sulphate of iron.

Shapmoor, Westmorland, is sulphurous and saline; same as Askeron.

Shettlewood, Derbyshire, is similar to Harrowgate.

Shipton, Yorkshire, same as last named.

Somersham, Huntingdon, contains sulphate of iron; is applied to old ulcers.

Spa, Germany, contains carbonate of soda, iron, carbonated earth, sulphate of magnesia, and muriate of soda; is used in diseases of menses, hysterical and dropsical affections.

Spain contains several waters of little note.

St. Amands, Valenciennes, sulphurous, is used in eruptions.

St. Bernard's, Edinburgh, is a strong sulphurous water, same as Harrowgate; and is used in scorbutic and scrofulous diseases.

St. Chad's Well, London, is aperient.

St. Erasmus' Well, Staffordshire, same as Borrowdale.

St. Jauveur, near Luz, Upper Pyrenees, similar to Barèges.

St. Winfrede's, Wiltshire, resembles Malvern.

Stafford in Connecticut, a sulphurous water, also chalybeate.

Stanger, Cumberland, contains sulphate of iron.

Stenefield, Lincolnshire, similar to Orston.

Streatham, Surrey, contains carbonated earth, sulphate and muriate of magnesia.

Suchaldza, Hungary, similar to Nezdenice.

Sweden, mineral waters of, said to contain muriate of potass.
Swansea, Glamorganshire, similar to Shadwell.
Swabia, Baden, is a warm sulphurous water; temperature 132°.
Sydenham, Kent, is similar to Epsom.
Tarleton, Lancashire, similar to Scarborough.
Tetuccia, Italy, famed for baths.
Tewkesbury, Gloucestershire, similar to Acton.
Thetford, Norfolk, a carbonated chalybeate.
Thorston, Nottingham, same as Orston.
Thursk, Yorkshire, same as Scarborough.
Tilbury, Essex, is diuretic and diaphoretic.
Tibshelf, Derbyshire, is similar to Spa.
Tonstein, Germany, is similar to Seltzer.
Toplitz, Austria, a saline water; famed also for baths.
Tunbridge, Kent, contains iron, muriate of soda, and calcareous earth; used in all diseases in which chalybeates are serviceable.
Turkey, waters of, very little known.
Vals, Dauphiny, contains carbonate of soda; is diuretic and diaphoretic.
Vesoul, Upper Saone, is aperient, refrigerant and diuretic.
Vichi, near Moulins, contains carbonate of soda and sulphate of iron; is used in jaundice, affections of the kidney and bladder, and in sterility.
Virginia, bath waters of, warm; 96°, others near to 108°.
Viterbo, in Italy, said to contain sulphurous acid.
Wardrew, Northumberland, is similar to Harrowgate.
Wallenfrow, Northampton, same as Islington.
West Ashton, Wiltshire, similar to last named.
Westwood, Derbyshire, same as Shadwell.
Wexford Spa, is said to be like Islington.
Whiteacre, Lancashire, contains carbonate of iron and lime.
Wight, Isle of, a strong aluminous chalybeate.
Wisbaden, Germany, a carbonated water; is famed for baths.
Wildungen, Germany, said to be similar to Bath.
Wildbad, Germany, famed for warm baths.
Witham, Essex, contains carbonate of iron and muriate of soda.
Wirksworth, Derbyshire, sulphurous, saline and chalybeate.
Wurtemburg, Germany, famed for baths.
York, in Pennsylvania, a sulphurous water.
Zahorovice, Germany, similar to Nezdenice.

As the Mineral Waters of Ireland have been noticed by few writers, and are consequently little known, the author deems it necessary to add a brief account of them, in order to complete this work.

INTRODUCTION.

Mineral Waters have at all times attracted the attention of the Medical Faculty, in consequence of the peculiar medicinal properties which they possess, and the virtues which they were supposed to exhibit. In the Heathen Mythology, we find that each spring was supposed to contain wonderful properties, under the auspices of a tutelary Diety; and it is very probable that on the introduction of Christianity, these fountains were dedicated to particular Saints, many of whose names they retain at this day. Nevertheless we are almost quite ignorant of their first discovery, or antient history; nor have we any accurate or authentic account of their administration as medicaments, previous to that handed down to us by the consummate scrutator of nature—the Father and the Founder of Physic.

The immortal Hippocrates, who first separated Medicine, from the study of Religion and Philosophy, and reduced the chaos of his predecessors, to a useful and liberal art—to a noble and dignified profession; noticed the subject of Mineral Waters. He first gave the healing art, the air of a science; "he found it a skeleton and clothed it with "flesh, colour and complexion; he embraced the cold statue which by "his touch became life, sense and beauty; and his great works survive "the vagaries which pass through the mind of each giddy innovator."* "Those waters," said this great man, "which spring from rocks are "generally hard, other waters are warm and afford iron, brass, silver, "sulphur, alum, bitumen and nitre. Some are sweet, others saline, "many aluminous, and each different in its effects from the other."

* *Lord Avenmore's eulogium on Blackstone—Life of Curran.*

This extraordinary man flourished about 460 years before the redemption of mankind. It is certain, however, that the art of Medicine was practised and cultivated many centuries anterior to his time, by certain individuals among the Egyptians, who were denominated physicians. These practitioners existed as a profession at the death of Jacob, A. M. 2315—A. C. 1689,* whose body they were commanded to embalm by Joseph.† They paid great attention to ablutions and purifications, but we have no account of their using Mineral Waters. Mayor informs us, that the warm springs of Palestine were known so early as the year of the world 1921; and Moses recommended bathing in the cure of cutaneous diseases soon afterwards. Aristotle who flourished A. C. 384, and was deemed the successor of Hippocrates, writes about certain acidulous waters in Sicily; and Pausanias who lived A. C. 336, writes of the Mineral Waters of Caria, in Asia Minor, which were as sweet as milk. Immediately before the commencement of the Christian æra, Strabo describes certain springs which were useful when drank as well as bathed in; and immediately subsequent to that period, three writers of note, attended to this subject. 1. Athæneus of Cicilia, gave an account of a fountain in Paphlagonia in Asia Minor, which possessed an inebriating quality; and to which the inhabitants of the country frequently resorted. 2. Vitruvius stated that warm and cold springs were employed internally, and praises bituminous waters as of singular efficacy in many diseases. 3. Seneca writes, "there are Mineral Waters which strengthen the eyes and nerves, others which heal ulcers, many which relieve the lungs and other viscera, and some which even suppress hemmorrhage."‡ The younger Pliny, who was

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* *Bossuet sur L'Histoire Univers. p.* 16.

† *Genesis c. l.*

‡ *Quæst. Nat. Lib. iii.*

born before the middle of the first century, describes many Mineral Waters in Italy, Syria, Æthiopia, Greece, France, India, Arabia, Phrygia, and Germany; and enumerates their properties, when used either internally or externally. He remarked the chalybeate taste left on the palate, by the celebrated German Spa Waters. Celsus, a medical writer of great reputation of the same period, is silent on the subject under consideration; yet Scribonius Largus his contemporary, praises chalybeate waters in diseases of the bladder. Claudius Galen, who flourished in the early part of the second century, and wrote 300 volumes on Medicine, is silent on Mineral Waters. Oribasius of Pergamus, Paulus of Ægina, Ætius of Alexandria, Alexander of Trallia, who flourished in the 3d, 4th, 5th, 6th and 7th centuries, recommended the internal use of Mineral Waters. I regret that I have not an opportunity of consulting at present, the works of their successors, Aaron of Alexandria, Mesue, Serapion, Rhazes, and Avicenna of Arabia, or Constantinus of Carthage; who flourished in the 8th, 9th, 10th and 11th centuries; and am therefore unable to state their opinions on the subject.—From this period a universal cloud of ignorance involved mankind and the sciences in obscurity, until the year 1440; when paper and the art of printing were discovered, and soon caused literature to emerge from darkness and shine forth with unprecedented splendour. Baccius of Ancona, was as far as I can judge, the next writer on Mineral Waters; and he ascribed all their efficacy to gold, silver, quicksilver, tin, lead. We commence the 17th century with an account of the Hon. Mr. Boyle, afterwards Earl of Cork and Orrery, and ancestor to the present noble family who bear that title, a most distinguished philosopher and chemist, who was one of the first, according to Fourcroy, that mentioned the several re-agents capable of indicating the sub-

stances dissolved in water, by the alteration produced by their colours.* He published a work on Mineral Waters exclusively 1685—Sydenham wrote at the same period and recommended Mineral Waters. The Academy of Sciences of Paris, appointed M. Du Clos in 1667, to analyse the Mineral Waters of France; while Hierne examined those of Sweden the same year. In the year 1707, Geoffroy pointed out the method of procuring the solid ingredients of impregnated waters, by evaporation. The celebrated Hoffman published a work on Mineral Waters 1717. M. Boulduc was the next writer on the subject 1729, and the most perfect of any before his time. He evaporated the water, filtered the precipitates which were deposited in proportion as the evaporation proceeded; and he employed alcohol to separate saline substances. The Hon. Mr. Cavendish in 1767, discovered that lime was held in solution by carbonic acid; Boulduc first detected carbonate of soda and its properties; Le Roi, of Montpellier, muriate of lime; Margraaf of Berlin, muriate of magnesia; Priestley, carbonic acid; and Monnet and Bergman, sulphuretted hydrogen gas. The chief other writers of the 18th century, were Black, Klaproth, Westrump and Rutty. And in the commencement of the 19th century, Dr. Kirwan of Dublin, published a work on Mineral Waters, replete with the most accurate views ever offered on the subject. Dr. Saunders next published his excellent work, then came the valuable observations of the late truly scientific Dr. Murray of Edinburgh; and the latest and best writers to the present time, are Dr. Henry of Manchester, and Dr. Thomson of Glasgow, who published their inimitable treatises on chemistry, in the year 1824. There are many other physicians of respectability however, as Drs. Garnet, Scudamore, Barlow, Mc. Kenzie, &c. who have written on certain Medicinal Waters, and whose names are introduced in the following Treatise.

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* *Boyle's Expts. on Colours—Oxford,* 1663.—*Fourcroy's Chemistry, v.* 3, *p.* 445.

ON THE

MINERAL WATERS

OF

IRELAND.

CHAPTER I.

THE Mineralogy of Ireland has been much cultivated and improved by the valuable inquiries of that learned and most excellent Institution, the ROYAL DUBLIN SOCIETY. It is also highly gratifying that this extensive field of science is about to be further explored, by those patriotic individuals, who recently formed themselves into a Society called the MINING COMPANY OF DUBLIN.

THIS part of the United Kingdom is said to rest on a bed of granite, and to abound with many valuable minerals and metals. The siliceous genus, as the onyx, agate, jasper, garnet, and amethest; many species of quartz and crystal, together with quartoze sand for the manufacturing of glass, abound in this island. In many parts of the inland counties, extensive and uniform beds of limestone and marble, form the under strata. The beautiful marble seen in the venerable mansions of antiquity, prove that our numerous quarries of this substance, were early wrought by our ancestors. On the mountain of Croughan in Wicklow, gold and silver have been found in great abundance; and this county as well as that of Kildare, Queen's County, and Tipperary, contain immense beds of copper, lead, and iron ore. The County of Kil-

kenny is also stored with great quantities of copper, lead and iron ores; inexhaustible coal mines, beds of beautiful marble, red, slaty, and ferruginous argillite and manganese.—It contains granite hills uniting with siliceous schistus, and a little deeper the argillaceous slate. Large pieces of quartz with streaks enclosing yellow mica, are sometimes found on the surface of this fertile district. The most abundant minerals are granite, siliceous schistus, siliceous breccia, slaty argillite, ferruginous and sciliferous argillite; sciliferous limestone, yellow oehre, iron ore, manganese, copper, galena and the coal mines. For an account of the Mineralogy and Geology of this County, I am principally indebted to the admirable and learned work in our extensive and valuable City Library, "The Statistical Sur-"vey of the County of Kilkenny," by the late Mr. Tighe of Woodstock in this county. In enumerating the numerous Mineral Waters of Ireland, I shall describe those of each County and in each Province; and as that of Leinster contains the most noted Medicinal Springs in the Kingdom, and as the County of Kilkenny has been long famed for its excellent Spa at *Ballyspellan*, which has been described by all Medical Writers since the commencement of the last century; I shall therefore take the liberty of commencing with an account of it.

On the Mineral Waters of the Province of Leinster.

CHAPTER II.

County of Kilkenny—*Johnstown* formerly *Ballyspellan Spa*, proceeds from a rock of brittle slate consisting of ferruginous argillite; the hill above it

is of the same material, accompanied to the north by siliceous schistus; the hills to the south-east are limestone. The water collects on these heights, is filtrated through the upper beds, and then passes into the ferruginous slate; at the further end of which, it forms the Spa at *Ballyspellan*. It is a clear, cold, pellucid water, agreeable to the taste, is inodorous, and when taken up appears to contain some air bubbles, which rise and suddenly vanish; the temperature changes a little, and the spring never ceases. It contains iron dissolved in carbonic acid, and in the opinion of Dr. Munro, muriate of soda. Dr. Rutty states, "that it passes "through the Irish slate," the aluminous schistus, "and was weaker in dry weather, for after rain it "struck a deeper colour with logwood." It is said to resemble Islington and Hampshead in England, and the Groisbeck Spa in Germany. It should be drank at the source. Dr. Taaffe published a work "on the Irish Spa" as it had been called, in 1724, and Dr. John Burges wrote his "Essay on the "Water and Air of Ballyspellan," 1725. It has been strongly recommended by the most intelligent Physicians since that time; and is highly beneficial in dropsy, jaundice, chronic disease of the liver, in disorders of the skin, in nervous, bilious, hysteric, and certain female complaints. There is a Spa-House and good accommodation, the lodgings are comfortable; the houses form the sides of an octagon, in the middle of which four roads intersect each other, and trees ornament these avenues. This water is one of the best simple chalybeates in Ireland, and has been long justly esteemed, and is much frequented.

Kilkenny College Spa is situated on the banks

of the river NORE in a marble quarry on a blue clay; and is a chalybeate. Dr. Thomas Hewetson sunk a pump over it in 1734; and secured it from the inundation of the river except in time of floods. It contained iron, sulphur calcareous earth and muriate of soda.

KILKENNY CANAL SPA was examined in DUBLIN, contains carbonate of iron, muriate of lime, and argil. The most charming walk for more than 1¼ mile in length, agreeably planted along the banks of the Canal, with the delightful scenery adjoining, have been long favoured and frequented by the citizens and visitors of Kilkenny. The Spa, however, is neglected. There is another spring lower down on the Canal near Millmount, the seat of Mr. Colles, of a sulphurous nature.

JOHN'S-WELL SPA is within four miles of this city, is a cold transparent water, with a styptic taste, is a chalybeate, and said by Dr. Garnet, late of Trinity College, to contain sulphur; but I must beg to remark with due deference to that learned gentleman, that on the most minute examination, I could not detect the presence of sulphuretted hydrogen gas, or sulphur.

CASTLECOMER Mineral Water is nine miles from this city, is situated in the beautiful DEMESNE of the DOWAGER COUNTESS OF ORMONDE. It contains iron, carbonic acid, and muriate of soda. The town whose name it bears, is improved on the English plan; and the free access afforded by the Noble Proprietor to the beauties of a classic Demesne, are advantages seldom to be enjoyed at watering places in this country.

There is a sulphurous water, near the Abbey of Jerpoint; and chalybeates at COOLCULLEN, BALLYTARSENY, KILCULLEN, LISTERLIN, and CULLOHILL.

BROWNSTOWN SPA is situated in a fertile plain, in the Liberties of the City of Kilkenny; it proceeds abundantly from a gravelly blueish soil, and is seen bursting forth from many distinct points through the surface of the strata which forms the bottom of the fountain. It is a transparent, colourless inodorous fluid; its taste styptic, saline, slightly chalybeate and not disagreeable. It undergoes a slight change on being exposed to the air, loses almost imperceptibly its transparency; and perhaps cannot be conveyed to any considerable distance without suffering decomposition. The well is enclosed, and the atmosphere in a great measure excluded. The specific gravity at 60°, is the same as of fountain water at a similar temperature. There is a great ochrey deposition on the sides of the well, which is oxide of iron and argil. This chalybeate bears a very strong resemblance to the CHELTENHAM WATER, "which issues from a sandy bottom mixed with "blue clay; the sides of the well are covered with "a yellowish ochre indicating the nature of the wa-"ter. When first drawn it is a clear colourless wa-"ter rather brisk, has a saline bitterish, chalybeate "taste, and cannot be conveyed to any distance "without decomposition."* The medical properties of both Spas are perfectly similar.

I APPLIED the following tests successively to different quantities of the BROWNSTOWN WATER, and observed the following appearances:—

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* Saunders on Mineral Waters, p. 277: 1800.

I. Infusion of litmus, syrup of violets, juice of the scrapings of radishes, had no sensible effect on the water.

II. Tincture of galls caused the fluid in a few seconds, to assume the colour of port wine.

III. Sulphuric acid caused a slight effervescence and an escape of carbonic acid, which assumed the form of sparkling drops on the bottom of the vessel. This acid induced a copious chalk coloured precipitate.

IV. Oxalic acid induced an immediate copious precipitate.

V. Expiration from the lungs, produced no effect on the water.

VI. Lime water being added, there was a slight precipitate.

VII. Polished silver was untinged by the water, nor under any circumstances did I perceive the odour of sulphuretted hydrogen gas, or sulphur.

VIII. Pure ammonia caused a copious sediment of a pale yellowish colour; did not change the water to a blue colour, neither was polished iron coated with copper on being immersed in the fluid for many hours.

XI. Nitrate of silver induced a white pearl colour precipitate.

X. Muriate of barytes had no sensible effect on the water.

The water being boiled, tincture of galls had no effect, neither had the sulphuric acid; and sulphuretted hydrogen gas was not extricated.

From these experiments it appears that this Mineral Water does not contain pure gases, alkalies or acids, if we except the carbonic acid which it has in excess, besides that portion which holds a great quantity of iron in solution; but carbonate or sulphate of lime, carbonate or sulphate of magnesia, muriate of soda; no sulphuretted hydrogen, sulphur or hydro-sulphuretes of alkalies; no copper or nickel, and some argil.*

I have collected the following information, from a great number of persons whom I recommended to this Spa, after the antecedent Analysis. On first taking the water a degree of drowsiness or headache sometimes supervenes and disappears in a day or two, as observed on first using the Cheltenham waters. It improves the appetite and strength, and has been highly serviceable in stomach, nervous and bilious diseases, whether the consequences of debility, intemperance or residence in warm climates; in calculous and other diseases of the kidney and bladder, in chlorosis and other female complaints; in scrofula and some cutaneous diseases, commonly called scurvy, in both of which warm bathing should be employed at the same time; in incipient stages of dropsy and anasarca, when induced by obstruction of the liver; and it has had also very good effects in destroying worms especially tænia and lumbricus. It is diuretic on most persons, aperient on many, and astringent on a

* Dr. Barker, Professor of Chemistry in Trinity College, Dublin, has done me the favour to examine this Analysis, and *has approved of it*; of which "he will give a Certificate conjoined with mine, as soon as he "shall ascertain the quantity of active ingredients in the water;" some of which I sent him, and which I presume before this time, he has subjected to Analysis.

few; it was taken in the quantity of half-a-pint, which was repeated after gentle exercise for a few minutes: some took 1½ pint daily. It suffers decomposition if removed to a distance even of a few miles, and has violent aperient effects. In one instance where it was removed about four miles from the source, I knew it to act as a severe aperient on three different persons, who took only the quantity of half-a-pint; while in other cases it became necessary to order some aperient twice a week when taken at the fountain. It has been used by an immense number of persons last season, as soon as my opinions were known on its nature; and though many drank it without medical advice, I have never heard of its producing any bad effects of serious consequence. It is highly approved of, by the most intelligent of the Profession here; and recommended by some of the most eminent Members of the Faculty in Dublin. The Medical Reader will please to excuse my enumeration of those diseases, in which it is improper. It is highly injurious in delicacy of the lungs, fixed pain in the chest, spitting of blood, hard dry or long continued cough; in violent palpitations of the heart, or in any of the diseases of that organ; it is peculiarly dangerous, like all chalybeates in consumptive habits, and should be used in all complicated or doubtful diseases, on the advice of competent medical authority. It would be also improper in all cases of local acute pain, whether of the head, lungs, liver, stomach, spleen, kidney, uterus, &c.; or in case of full habit, especially for those advanced in life, and who may be predisposed to apoplexy.

Kilkenny has been universally admitted as one of the most elegant Cities in the kingdom, and is

abundantly supplied with every commodity which can be procured in any part of the country; it affords excellent accommodation on fair, and indeed, moderate terms. A select and valuable Public Library well supplied with the popular periodical works of the day, and the lighter productions of the most eminent writers, with an excellent collection of English and Irish Newspapers; are interesting advantages to which the visitors of our city, have free and easy access. There are Assembly-rooms, Billiard-tables and many sources of amusement in KILKENNY. From its central situation, it is well adapted for the reception of invalids, and from its vicinity to the ocean the climate is rendered more healthy and equable; for the clouds which are driven forwards by the west and south-west winds, are not arrested by high mountains, but passing over low secondary hills and extended plains, do not empty their contents on this county. From these circumstances the weather is generally finer, and vegetation is further advanced than in the adjoining districts.

THERE is a SPA-HOUSE and BALL-ROOM to be immediately erected at *Brownstown*, and it affords a circular level drive in the Spa-field, of half-a-mile's extent; which is most convenient and advantageous, for the exercise and amusement of its visitors.

CARLOW—*Garryhill Spa*, is a weak chalybeate.

DUBLIN—*Lucan*, and *Golden-Bridge* Mineral Waters, are very strong and sulphurous, and much frequented; while the Spas in the *Phenix-Park*, at *Kilmainham* and *Dunnard*, are chalybeates; and those of *Francis-street*, and *Hanover-lane* are strong saline waters. *Tober Bony* is said to be an alkaline water. The scenery of this county is charming and delightful, favoured much by nature and embellished by art; it is highly

cheering to the drooping invalids of an extensive Metropolis.

Queen's County—contains *Killeshan Spa*, a strong chalybeate.

Wexford Spa—Is a chalybeate highly esteemed, and much frequented.

County Meath—*Nobber* and *Kilbrew Waters*, contain sulphate of iron, are not used.

On the Mineral Waters of Munster.

Limerick—This County is famed for its very strong chalybeate at *Castleconnel*, which has been compared to the German Waters by very competent judges. Its vicinity is highly ornamented, its accommodations good, and it is much frequented.

Cork—*Mallow Spa* is situated on the south side of the town whose name it bears, and on the north of the Black Water. It arises perpendicularly from a lofty limestone hill, and discharges 20 gallons in the minute, or 1,200 in an hour. The temperature is nearly the same at all seasons, is about 69°, when the adjoining brook is 50°. Dr. Rutty found the same thermometer 76° at Bristol, 68° at Mallow; and 50° at the adjoining spring. This water is acidulous containing lime, muriate and sulphate of soda, sulphate of magnesia, and selenite. It is warm, clear and agreeable to the taste, and when raised from the well emits a vaporous exhalation. It is similar to Bristol and Buxton Waters, and is now their greatest rival.

It is found highly serviceable in the incipient stage of pulmonary co..umption, it restores the appetite, allays hectic symptoms, as flushings, burning heat in the hands and feet, partial night sweats, and troublesome cough. It is of use in

chlorosis, hemmorrhoids, and diabetes. It is frequented by an immense crowd of visitors, hence called latterly the Irish Bath. It was accidentally discovered by Dr. Rogers of Cork in 1689, though one of the adjoining wells had been dedicated to St. Patrick. We are told by Dr. Smith* that one of that gentleman's patients in Cork was ordered to Mallow for change of air, being to all appearances dying of consumption, her stomach rejected almost every thing until she accidentally drank some of the Spa, which evidently appeased it; she now began to regain her strength, and ultimately recovered.

The air is warm, the town being sheltered in a great measure, the walks are pleasant and agreeably planted; and on each side are canals and cascades for the amusement and exercise of the company. There is a handsome Assembly-room in town, a variety of beautiful demesnes in the vicinity, and the best accommodation on moderate terms.

There is another spring to the east of the Spa which is also warm, and at which Mr. Jephson is about to establish public Baths, on the same plan as those of the city of Bath. There are two chalybeates, one at *Quarterstown* one mile east, and another at *Beare's-Forest*, one mile south of Mallow. The County of Cork contains many Mineral Waters of minor note, as the chalybeates of Drumrastel, Glanagarin, Rostillan, Monybohol-ane between Castle Townshend and Skibbereen, also there is a sulphurous water here; and a strong chalybeate at Ballynphelick between Cork and Kinsale. *Kanturk Spa* contains iron and sulphur, and is much praised in nephritic, stomach, cutaneous, scrofulous, and dropsical diseases. *Bandon*, Garretstown, Timoleague, Cronacre near Done-

* Smith's Hist. of Cork.

raile, Ballyvourney, Carricgnacurra, Killindonnel near Cork, Shippool, Dundaniere, Mourne-Abbey, Drumore-wood, Kilpaddes, *Maccromp*, Ardarick 2½ miles from Cork, and *St. Bartholomew's-Well*, are all chalybeates. *Cape Clear Water* is saline, aperient, diuretic, and sudorific.

KERRY—*Castlemain*, Tralee, is a chalybeate and sulphurous water. *Maherabeg* is a saline, aperient Mineral Water.

WATERFORD—*Crosstown Spa* contains sulphate of iron, and *Clashmore* is similar, is often emetic, sometimes aperient and diuretic.

TIPPERARY—*Clonmel Spa* was said to cure scrofula, but is now unjustly deserted. Annfield near Burrisoleigh, Ballinlough near Toomivara, Corville near Roscrea, and Ballinahough near Thurles are all chalybeates.

CLARE—*Kilcoran*, *Liss-don-varna*, Scool, Cloneen near Castle Lemenagh, Kilkessen, *Cassino* near Milltown Malbay are chalybeates: and *Montpellier* at *O'Brien's-Bridge*, is a sulphurous water.

On the Mineral Waters of the Province of Connaught.

CHAPTER IV.

GALWAY SPA is said to be similar to Tunbridge, contains iron, muriate of soda, calcareous earth, and selenite.

ROSCOMMON—*Athlone Water* is a simple and weak chalybeate.

LEITRIM—*Anaduff*, Drumasnave, Dronisnamullock, and Athimonus, are strong sulphurous waters. Cavan and Oakfield are chalybeates.

CHAPTER V.

CAVAN—*Swadlinbar* is a transparent colourless water, containing sulphuretted hydrogen, carbonate and muriate of soda, sulphate of magnesia, and an earth. This is admitted to be the strongest sulphurous water in Ireland; it is highly ornamented by the adjoining inclosures, its accommodations are good, and its visitors numerous.

Derrylester and *Derrindaff Spas,* are similar to the last named; and are employed internally and externally in the cure of cutaneous disorders.

OWEN BRUEN is also a strong sulphurous water, Carrickmore a saline, and Mont Pallas a chalybeate water.

THE efficacy of the Healing Lake in curing scorbutic ulcers, is attested by many respectable gentlemen of the neighbourhood.

FERMANAGH—*Ashwood* and *Drumgoon,* are saline and sulphurous; Killasher, Lisbeak, *Michan* and *Derryinch,* are strong simple sulphurous waters.

TYRONE—*Aghaloo* is a saline and sulphurous water.

NEWTON STEWART is a saline, calcareous chalybeate.

DONEGAL—*Pettigree* is strongly sulphurous, and *Kilroot* contains muriate of soda and carbonate of lime.

ANTRIM SPA, contains muriate of soda and carbonate of lime.

BALLYCASTLE is a chalybeate and sulphurous water; and *Carrickfergus* is of a blueish colour, is said to contain copper, and is aperient.

Down—*Ballynahinch* is a chalybeate sulphurous water; there is also a simple chalybeate near this Spa.

Granshaw—*Killagee* and *Scordin's-Well* are strong chalybeates, *Dromore* is a saline and sulphurous water; while *Lough-Neagh* is said to cure running ulcers.

From the various effects which Mineral Waters have on the human body, it should seem that Nature has done for us in a great measure, all that the Colleges of Physicians aim at in their Dispensatories and collections of prescriptions; namely, supplied mankind with many safe, easy and efficacious remedies, prepared to our hands in a more elegant manner than the most modern chemistry or pharmacy can rival. The more we pursue our inquiry on medicinal waters, the more convinced we are of the many beneficial effects we find abundantly afforded from this source.

On the Classification of Mineral Waters.

CHAPTER VI.

Impregnated Waters have been divided into different classes by authors; all of which hitherto proposed, are imperfect and liable to objection. Thus the grand division into Acidulæ or cold acidulous, and Thermæ or warm waters, left us quite at a loss to know the elementary principles of such waters, which in many instances are the same in both classes. M. Monnet divided all Mineral Waters into the alkaline, sulphurous, and ferruginous; which omits some of the most active ingredients, in Medicinal Waters. Duchanoy, as if to obviate this, divided them into ten classes; the gaseous, alkaline, earthy, ferruginous, simple hot, gaseous, thermal, saponaceous, sulphurous, bituminous and saline. Here are classes as the bituminous, denied

to exist by the best Chemists. Dr. Saunders declares the difficulty of arranging and reducing into classes, the various Mineral Waters. Fourcroy divides them into the acidulous, saline, sulphurous and ferruginous; yet I think the best division is founded on chemical distinction, and this I shall adopt; although there are many chemical classes of which there are few, if any examples, afforded even by the numerous Mineral Waters which have been hitherto examined. Still I think this the only true and scientific classification.

I. Gaseous—Those containing oxygen, as observed by Scheele; Nitrogen as by Priestley, by Pearson in Buxton, by Garnet in Harrogate, and by Lambe in the Leamington Waters.

Carbonic Acid Gas is found in most Mineral Waters.

Sulphuretted Hydrogen was found by Scheele, Rouelle and Bergman.

II. Acid Waters, or those containing sulphurous acid, as at Viterbo in Italy,* also at Salvena, by Theophilus Grissonius, Varennius found it at Nota in Sicily; and Dr. Monro speaks of acid dews in the East Indies—Boracic acid has been found in some waters in Italy.

III. Alkaline Waters containing pure Soda or Ammonia. Dr. Black found the former in the waters of Geyser and Rykum in Iceland.

IV. Saline—containing neutral salts, the most common class.

V. Pure Earthy Waters—as those containing silica and alumina, the waters of Geyser containing the former.

VI. Alkaline Earthy Springs—which contain lime, magnesia and their combinations; these are the calcareous waters of former authors.

VII. Metallic—*Chalybeates*, as the ferruginous waters.

The Waters best known, and mostly to be met with at present are,

Gaseous—Carbonated as in England—*Kilburn*, which is saline and calcareous, also *Wallenfrow*—France—*Langeac*, *Vals*—Germany, Seltzer sal:

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* Vandellius De Agri Patavini, 1761.

and cal.* Tonstein, Wisbaden, Pyrmont chalyb. and cal.: and SWITZERLAND, *Scolliensis.*

SULPHURETTED OR *Sulphurous*—IRELAND, *Leinster, Jerpoint, Milmont, Lucan, Golden-Bridge*—MUNSTER, *O'Brien's-Bridge*—CONNAUGHT, *Anaduff, Drumasnave, Dronisnamullock, Athimonus*—ULSTER, *Swadlinbar, Derrylester, Derindaff, Owen Bruen, Ashwood, Drumgoon, Killasher, Lisbeak, Michan, Derryinch, Aghaloo, Pettigree and Dromore*—ENGLAND, Codsalwood carbonated, Dudley, carb, cal, and chal.; Llandrindad chal. Shapmoor sal.: Inglewhite chal. and carb.: Mandley, and Shettlewood sal.: Westwood chal.: Wirksworth sal. and chal.: Askerson and Broughton sal.: Harrogate and Loansbury, sal.: Normanby cal.: Rippon sal.: and cal.: Shipton sal.: Hartlepool chal. and sal.: Gainsborough chal. and cal.: and Nottingham saline.

SCOTLAND—St. Bernard's Well, Corstorphine, Moffat sal. and carb.: Castleleod sal.: and Fairburn cal. and sal.

I. FRANCE—Montmorency, Bagnieres, Bagnols, Bourbone, sal.: St. Amands, Cauteres chal.: Mont D'Or, Motte, Bareges, cal.: Plombieres, sal.: Dax, Bonnes, and Cransac.—NETHERLANDS, Enghien.—GERMANY, Aix la Chapelle cal. and sal.: Borset, alk.: Baden, Chaude Fontaine, cal, and sal.: Frankfort sal.:—SWITZERLAND, Alvenenan, and in ITALY, Baia and perhaps Viterbo.

II. SALINE—IRELAND; LEINSTER, Francis-street, Hanover-lane, Dublin—MUNSTER, Cape Clear—ULSTER, Carrickmore—ENGLAND, CHELTENHAM chal.: Tewksbury, Chadlington sal.: Holt cal.: Cobham chal.: Epsom, Joseph's-Well and Richmond cal.: Acton mag.: Bagnigge, Kensington

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* Sal. *saline*; cal. *calcareous*; sulph. *sulphurous*; chal. *chalybeate*, carb. *carbonated*, and mag. *magnesia*.

mag.: Pancras cal.: Dog and Duck, Tilbury, Erasmus' Well, Leamington and Newinham Regis cal.: Kinalton, Barrowdale cal.: Durham sulph.: Hanley's and Morton cal.—FRANCE; Digne sulph: Bourbon L'Archambout, Balaruc, Vichy chal. and sulph.: and Pontgibault sulph.—GERMANY, Kuka Spa, and Toeplitz.

III. SALINE EARTHY OR CALCAREOUS and MAGNESIA WATER.—IRELAND, Mallow, Kilroot and Antrim.—ENGLAND, Bath, chal.: Bristol, Clifton, Barnet, Brentwood and Streachtan sal.: Malvern, Hanbridge sal.: and chal.: Knowsley, Neville Holt, Sydenham, Cartmel, Tarleton and Dulwich, all sal.: Buxton, Matlock; Cawley sulph.: Newtowndale, Scarborough carb. Thursk same, Filah sal. and St. Winefrede's Well—SCOTLAND, Pitkeathly carb. and chal.: Dunblane similar—FRANCE, Pongues sal.:—GERMANY, Sedlitz or Seydscheatz, sal.: Wildungen like Bath and Grossal—SPAIN, Rivera de Abajo near Oviedo.

IV. METALLIC OR CHALYBEATE Waters—IRELAND; LEINSTER, *Kilkenny, Ballyspellan, Brownstown, Kilkenny College* and *Canal, Castlecomer, John's-Well,* Coolcullen, Ballytarseny, Kilcullen, Listerlin and Cullohill—CARLOW, Garryhill—DUBLIN; PHOENIX-PARK, KILMAINHAM and Dunnard—QUEEN'S COUNTY, Killeshan—WEXFORD—*Meath,* Nobber and Kilbrew—MUNSTER—LIMERICK, Castleconnel, CORK, Quarterstown, Beare's Forest, Drumrastel, Glanagarin, Rostillan, Monyboholane, Ballynphelick, *Kanturk, Bandon,* Garretstown, Timoleague, Cronacree, Ballyvourney, Carrignacurra, Killindonnel, Shippool, Dundaniere, Mourne Abbey, Drumore Wood, Kilpaddes, Maccromp, Ardarick and St. Bartholomew's Well—KERRY; *Castlemain* and *Maherabeg*—WATERFORD, Crosstown and Clashmore—TIPPERARY, Annfield, Ballinlough, Corville and Ballinahough—CLARE, Kilcoran, Lis-done-Varna,

Scool, Cloneen, Kilkessen, and Cassino—Connaught; *Galway*, Athlone and Cavan—Ulster, *Mont Pallas*, *Newtown-Stewart*, *Ballycastle*, *Ballynahinch*, Granshaw, *Killagee*, *Scordin's-Well*—England, Deddington sal.: Chippenham, Road sal. and sul.: Sene or Send, West Ashton, Tunbridge sal. and cal.: Bromley, Islington, Shadwell, Colchester sal.: Felstead, Leez, Markshall, Witham sal.: Sommersham, Dortshill, Coventry sal.: Ilmington carb. and sal.: Balemore carb.: Kingscliff sal.: Weatherstack sal. and sulph.: Swansey, Haigh, Latham sal. and cal.: Whiteacre cal.: Miller's Spa sal. and cal.: Mosshouse, Carlton carb.: Orston carb. sal. and chal.: Thoroton same: Tibshelf, Malton, Drigwell sal. and sulph.: Cawthorp sal.: Stenefield sal.: Oulton, Thetford sal.: and Brighton.

Scotland—Dunse carb. and sal.: Glendy carb.: Kincardine, Hartfell s. iron: Peterhead, Aberbrothwick—France, Bologne, Cransac sul.: Passi, same: Forges and Provins carb.: Abeourt sal.: Aumale carb.: Conde same: Chaude carb.:—Germany, Caroline Baths carb. cal. and sal.: Cleves carb.: Das Wild Bad carb. and sal.: Egra sal.: Nezdeniee sal.: Pyrmont sal. and cal.: Zahorovice sal.: Carlsbad cal. and sal.: Driburgin sal.:—Russia, Bigova, Sarepta, Perekop and Naphtha—Hungary, Suchalaza sal.—Italy, Bandola, and Naples, St. Luke's—Spain, Buzot sulph.

Having thus enumerated the most noted Mineral Waters of Ireland, and a few of Great Britain and the Continent, I shall now proceed to state the effects of each class of them on the human body.

On the effects of Mineral Waters.

CHAPTER VII.

Mineral Waters have a specific action according to the foreign substances which they contain,

and their effects are generally greater than might be expected from the strength of their impregnations; owing probably to the circumstance of their great dilution, by which every particle is presented in a state of activity, and thus are admitted by the lacteals more readily than they would in a less diluted state.

I. Gaseous Waters—*Carbonated Waters* have a sparkling appearance, are decidedly stimulant, and are even capable of producing a certain degree of transient intoxication. They are highly useful in bilious diseases, nausea, vomiting and atony of the stomach.

Sulphuretted or Sulphurous Waters are stimulant and act on the skin and bowels, are praised in many diseases of the skin improperly called scurvy, as in herpes, scaly tetter, scald-head, leprosy, &c. in scrofula, chronic rheumatism, indigestion, vitiated bile, in nervous and hypochondriacal diseases, in hemmorrhoids, jaundice, apoplexy and plethora. The sulphur bath should be used in all cutaneous disorders, previous to which the skin should be well rubbed with soft flannel or a flesh brush, thus the medicated water will be applied to the little ulcers and will heal them more rapidly.

II. Saline Waters are aperient, and derive their effects from the neutral salts which they contain; when used mildly instead of inducing debility they increase the appetite, health and strength.

III. Saline earthy or *Calcareous Waters* act on the skin and kidney, are mostly warm, and are esteemed in chlorosis, complicated diseases of the liver, stomach and alimentary canal, which usually arise from a residence in warm climates, in stone and gravel, palsy, gout, hysteria; and especially in the incipient stages of pulmonary consumption. They induce vertigo and somnolency, and are said

to relieve hectic symptoms. Consumption is said to destroy 55,000 persons annually in Great Britain out of a population of 11,000,000, that is 1,000 daily.

IV. Metallic or Chalybeate Waters. Iron is the only metal which seems naturally friendly to the human body; it is the only one which contains nothing hurtful, and whose effects need not be dreaded. It is proved to be the colouring matter of the red particles of the blood, and has been found even in plants raised in pure water. We do not observe it in the analysis of the egg, until after incubation life becomes developed, then we find a particle of iron which is attracted by the magnet. The effects of this metal on the animal œconomy are very numerous, it stimulates the fibres of the stomach and bowels, increases the quickness and strength of the pulse, promotes different secretions in the more remote parts, and represses inordinate discharges into the intestinal canal; the pale emaciated countenance, from its use, assumes a healthy florid colour, and the alvine, renal, and cuticular excretions are increased. Fœtid eructations and black coloured fœces, are marks of this metal taking due effects. Chalybeates increase the quantity of the red particles of the blood, on which the stimulant and tonic powers of that fluid most probably depend. Iron has little or no action when taken into the stomach unless it be oxidized, during its oxidizement hydrogen gas is evolved; and accordingly we find that fœtid eructations are considered as indicative of the medicine taking effect.

Chalybeate Waters are useful in all diseases dependant on debility, where the solids are relaxed and the system weakened, and in the numerous class of nervous disorders these waters, when properly administered, often produce the happiest effects. There are no diseases which

appear under a greater variety of forms than those called nervous, for there is scarcely a complaint which they do not sometimes resemble.

Nervous Diseases are attended with timourousness, languor, lassitude, fickleness of temper and a want of resolution in all undertakings; a disposition to seriousness and sadness, and an apprehension of the worst as to future events, and on the slightest grounds a dread of the greatest evils. Lowness and dejection of spirits, great despondency, flatulency, spasmodic pain in the head and other parts of the body, giddiness, dimness of sight and palpitations; acid eructations, nausea, food becomes sour and vomiting of clear water, tough phlegm or blackish coloured liquor like coffee grounds, often takes place; urine may be sparing or copious, sudden flushes of heat in the face and other parts of the body, often a sense of cold as if cold water were poured on, flying pains in the arms, legs, back and other parts; pulse slow, hiccup, sighing and sense of suffocation, as if a ball were in the stomach or ascending towards the throat, and there is noise in the ears. The mind is disturbed on the most trivial occasions, and is hurried into the most perverse emotions, inquietudes, sadness, terror, anger, diffidence, and the patient entertains wild imaginations, extravagant fancies, the memory becomes weak and the judgment fails. The patient is in constant despair of health or dread of death, is peevish, fickle, impatient, and seldom gives any medicine a fair trial. From every slight feeling or sensation which they perceive, they imagine death is inevitable; and with regard to these opinions there is the most obstinate belief and persuasion. They also imagine that they labour under many disorders from which they are free, and are quite angry if any one attempt to remove the delusion. Delicate constitutions endued with ex-

quisite sensibility, are the chief victims of nervous disorders, and hence the disease is most common to women. These complaints are said to depend on a loss of energy in the brain, or on a torpid state of the nervous system, induced by various remote causes, as intense study, long and serious attention to abstruse subjects, the constant remembrance of some serious loss or disappointment, great anxiety of mind, leading an inactive, indolent or sedentary life, the use of crude, flatulent and unwholesome food, intemperance; also by obstructions of the liver or other viscera, by diseases of the stomach, kidney or its appendages and uterus; in fine, all causes which debilitate the system are said to induce nervous complaints. Every temperament, every constitution is liable to be affected with symptoms peculiar to itself. Those persons called passionate, are perhaps most subject to these disorders.

The termination of such disease is frequently more troublesome than dangerous, but if long continued is apt to produce enlargement of the viscera, general debility, dropsy, incurable melancholy or madness.—On dissection of those who die of hypochondriasis, the liver, spleen, or some of the abdominal viscera are mostly found enlarged, and in some instances the brain has been found affected. With respect to the cure, I shall only make a few general remarks more as to the diet and regimen, than as to medicine; as the great variety of dieases which may cause lowness of spirits, require a great variety of treatment; and hence the impracticability of treating of so many various topics in the present treatise. The attention of the patient should be engaged and directed to other pursuits than his own feelings; he should vary the scene frequently, associate as much as possible with agreeable company, and take exercise in the open air, as gardening, riding

on horseback, field sports, as hunting and shooting; and by all means to avoid idleness. He should not attend to his former pursuits. Exercise on foot, on horseback, or in a carriage, or some such vehicle, in the open air; or in whatever way the patient finds most agreeable, should be constantly employed. The diet should consist of light, generous, and nutritive food, carefully avoiding what is acescent or flatulent; and therefore animal food is the most proper. The patient should take food in small qnantities, well masticated and frequently in the day; and faintness should be avoided by taking a glass of port, sherry or madeira, occasionally. White wine or brandy and water should be taken for drink at dinner, late suppers to be strenuously avoided, as also tea and coffee, while cocoa or chocolate should be substituted. Punch, except in small quantity, is prejudicial.

Another class of diseases most intimately connected with that just described, are those of the stomach, as loss of appetite, nausea vomiting, flatulenc, eructation, rumination, pain in the stomach, heartburn and waterbrash, forming that most frequent distressing and Protean disorder, now generally called Bilious. I am quite satisfied that by far the greater number of the population of the United Kingdom are harrassed with this disease, which may be often removed by Mineral Waters. Dyspepsia or indigestion, or bilious disease of modern invention, was little known to the ancients, who in general were a warlike people, who used most manly exercises, and were free from the effects of luxury, and were sound in mind and body. But in modern times, when the arts are substituted for labour, when man becomes inactive and resides in large cities, where luxury and every species of intemperance prevail, dyspepsia became frequent. By the improvements

of society, the greater part of the night is often consumed in empty and foolish amusements, or in inebriation; in general most persons sleep the greater part of the day, which was destined for exertion of some kind, and the continual repetition of these irregularities, and such perversion of the order of nature must be surely productive of great derangement and of serious disease in the human body. Thus during infancy and childhood, when time is regulated and employed according to the dictates of the nature; and when the food is simple and regular, we scarcely ever witness the troublesome disease which I am about to describe.—But from the age of puberty, when the food and habits of individuals become more irregular, to the 50th year; it is of most urgent occurrence, and present perhaps in most families. It is common to every temperament and habit of body, in every climate and season, but more prevalent in Great Britain and Ireland than in any other country, and in summer more than in winter. Man, from his impetuosity, stronger passsions and intemperance, is more subject to it than the other sex, who live more regularly and sparingly. Dyspepsia consists in defective appetite, flatulency, acidity, heartburn, confined bowels, vertigo, circumscribed or diffused pain in some part of the head, imperfect vision as the appearance of motes, pains in the eyes, noise in the ears, tongue loaded with white or yellowish matter, teeth and gums furred, especially in the morning, when there is a bad taste on the mouth, sometimes increased flow of saliva; pulse feeble and frequent, sleep disturbed by turbulent and terrific dreams and startings, not refreshing, often attended with anxiety, moaning, spasms of the legs, palpitations or a sense of heavy weight on the chest, called nightmare. There is generally pain in the stomach and waterbrash, the mind is irritable, timid, inconstant and desponding; and the countenance

pale and expressive of great anxiety. There are often many slight transitory uneasy sensations in different parts of the body, slight perspirations and alternations of heat and cold. Urine may be sparing turbid, with an oily film on the surface, with or without sediment, copious or even passed with pain and in small quantity. If sediment be reddish it is lithic acid, if white consists of the phosphates. Bowels generally confined, stomach rejects the food acid, slightly changed, air is freely eructated sour or putrid, the former if vegetable and the latter if animal food had been taken; the acetous or putrid fermentation having partially occurred. Inflation, distention of air and rumbling noise in the stomach and bowels, are observed with a sense of tightness or narrowness in the œsophagus. The breath is fœtid and the eructations may be acid, putrid, bitter, insipid and empyreumatic.* Emaciation takes place from the due supply of nutriment not been properly prepared, or afforded to the body. All the symptoms are scarcely present in any case of this disease. This disorder mostly attacks the sedentary and studious, and those who lead inactive or irregular lives; and often continues for a considerable length of time without aggravation or alleviation. It is distinguished from hypochondriasis by occurring before the age of 50; and being unattended with horrors, suspicions, and fear of death.

The causes of this complaint are emotions of the mind as fear, grief, anxiety, joy, which are well known to impair the digestive process; thus a person about to sit down to dinner with a good appetite, on hearing sorrowful or joyful news will instantaneously lose all desire for food. Intense study and indolence render persons too inactive, and impair many functions for want of due circu-

* Mac. Bride's Pract. Physic. Dublin 1777, p. 64.

lation. How strong and robust is the laborious husbandman! The effects of humid and cold air are very powerful causes*, as also profuse evacuations, excess in the use of spirituous or fermented liquors, or too free use of warm diluents as tea, coffee, punch, which relax and debilitate the stomach; or of opium or tobacco, of the latter by the rejection of the saliva, which was destined for assisting in dissolving the food; also deficiency of bile, gastric or pancreatic fluids, broths, fat or smoked meats, cheese, butter or crude fruits. Chronic affections of the stomach often advance insidiously and slowly, and may be overlooked until they assume the character of organic and irremediable disease. In the early stage of such disorders the symptoms are included under the head of dyspepsia. The stomach may be partially or totally converted into schirrus, a case of which I have seen in the collection of preparations belonging to Dr. Sanders of Edinburgh, in which this organ was indurated, thickened, and so diminished in size as not to appear larger than a moderate sized pear. The patient to whom it belonged laboured under dyspeptic symptoms for many years and was greatly emaciated. Morgagni describes several cases in which the symptoms of dyspepsia were not very urgent; yet on dissection extensive ulceration was detected.† Dyspepsia may be induced by schirrus of the pylorus or cardiac orifice of the stomach; and Dr. Gregory mentioned a case in his Lectures, in which a schirrous tumour hung from the stomach and weighed more than 1lb. The same great Physician related a case where there was an abcess formed in the coats of the stomach and the contents were vomited. The stomach may be

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* Dissertatio Med. Inaug. De Genere Humano; auct. M. Ryan, Ed. 1821.

† Hamilton's Trans. of Morgagni, p. 326. Heberden's Commentaries, &c. c. 99.

perforated during life*. There is also a case mentioned by Boheraave in which the contents of the stomach passed through the ulcer in the œsophagus into the chest. (For further information on the functions of the stomach see the excellent and valuable Essay of Dr. Duncan, jun.† whose contributions to improvements in Medical Science are unequalled by any modern writer; and also the admirable paper of Dr. Abercrombie on the Diseases of the Stomach which was published in January last.)‡

From the great connection and sympathy which exist between the stomach and almost every organ in the body; derangement in digestion is symptomatic of many organic diseases. Dyspepsia is induced by disease of the liver, by gallstones, by affections of the kidney whether stone or gravel; thus the formation of urinary calculi is promoted by acidity in the stomach and alimentary canal, and alkalies, as soda, potass, or earths as magnesia or lime by neutralizing such acidity frequently relieve calculous disorders. Dyspepsia is symptomatic of disease of the bladder. The sympathy between the stomach and uterus is very great, hence dyspepsia is present in many diseases of the latter, as in amenorrhœa, menorrhagia, hyteria or during pregnancy. The sympathy between the stomach and lungs is well marked in the disease called dyspeptic phthisis, by Dr. Philip; and we are quite certain of the palpitations and the derangements of the heart being induced by dyspepsia. The sympathy between the stomach and brain is very great; thus a blow on the stomach will suddenly extinguish life without the appearance of any injury of

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* Dr. Crampton's acct. of this disease—(See Med. Chir. Trans. v. 8, p. 1—Trans. Colleg. Phys. Dub. v. 1—1818.)

† Ed. Med. Jour. 1821—p. 574.

‡ Ib. 1824.

that organ after death. Cold water has suddenly proved fatal when taken into the stomach, and no signs of inflammation or mortification found on dissection. Again a blow on the head will cause nausea and vomiting, and the latter symptom has long been considered as indicative of fracture of the skull from local injury. Certain poisons taken into the stomach may prove fatal, and leave no mark of local disease.

Dr. Hamilton and Mr. Abernethy have demonstrated the great connection between disorders of the abdominal viscera and the affections of the head, chest, abdomen and skin. Thus the correctness of the assertion of the immortal Hippocrates, "ut terra arboribus, ita ventriculus animalibus."

Dr. Philip considers dyspepsia a disease of debility, accompanied in the second stage with inflammation. Exercise of the body and mental quietude recommended in the cure. Acescent and oily food with a large proportion of liquid, compose the diet most difficult of digestion. A weak gastric fluid does not admit of being greatly diluted without having its powers much impaired. In the first stage of this complaint a diet composed of animal food and stale bread is the best, and all food now to be used should tend as little as possible to produce either morbid distention, or morbid irritation of the alimentary canal. If we except beef and mutton, Dr. P. thinks the flesh of old, is generally more easy of digestion than that of young animals, on account he says of the greater quantity of mucilage in the latter; all mucilages being difficult of digestion. Old meats produce a greater degree of irritation and fever than the flesh of young animals; hence the latter are said to be light, but as far as digestion is concerned they are heavier than mutton and beef. A similar observation applies to the vegetable compared with the animal kingdom. The former are less apt to ex-

cite fever and are therefore called lighter, though they are more difficult of digestion. The white kinds of fish are said to be lighter than the flesh of land animals, but in the opinion of Dr. P. are more difficult of digestion. These assertions are in a great measure contrary to general opinion, and are perhaps opposed to the sensations experienced by most dyspeptic patients. Of all flesh meat we are told the lean of venison is perhaps the most digestible; next in order are mutton, hare and partridge; and pork is most difficult of digestion.— Eggs are of a middle nature between animal and vegetable food, if soft boiled and eaten with stale bread are easily digested. New or fresh baked bread is very difficult of digestion; for by mastication, it forms a tenacious paste, which is not easily pervaded by the gastric fluid. Fresh vegetables on account of their tendency to ferment, are injurious in dyspepsia. Peas, beans, cabbages and waxy potatoes, are said to be worst; mealy potatoes, turnips, and brocoli among the best aliments. M. Lallemand makes the following observations on the comparative digestibility of aliments.* Fruits, leguminous vegetables and aliments whose basis was fecula, appeased hunger only for a short time; hence all had been led by experience to eat animal food. Vegetables remained in the stomach, only half as long as animal food. Peas, beans, potatoes, having undergone a culinary preparation, had been formed into a sort of pottage, and escaped almost without having undergone any particular change. Crude fruits passed in small compact masses without any alteration. He observed, "the more nutritive the "aliment, the more prolonged, active and ener- "getic the digestion. Substances least nutritious "and animalized are very difficult of digestion,

* Observations Pathologiques par F. Lallemand, Paris, 1818,

"and are those on which the digestive organs "soonest cease to act. The more different is an "aliment from our bodies, the more difficult of "solution in the stomach. Substances most ani- "malized are most nutritious, and the process of "digestion more laborious and long continued." Thus the antients said such substances were more difficult of digestion while they are most easy; for substances which are called light, and which contain little nourishment are scarcely acted on by the gastric fluid, for they pass out of the stomach nearly unchanged. Drink should be taken sparingly at dinner, and never but when there is a desire for it, because if there be no thirst, we may be assured the food already posseses the proper degree of moisture, and any addition to it will only dilute the gastric juice, and consequently enfeeble its solvent power.

Beer and all fermented liquors are considered injurious in nervous and bilious disorders. Ardent spirits, as brandy or whiskey and water, form the best drink, or madeira and water. New wines cause great acescency in the stomach, occasion flatulency and eructations of acid matter, heartburn, pain in the stomach, colic and diarrhœa. All stimulating drinks used at dinner, increase the gastric fluid, and promote digestion if taken in moderation. Tea if taken in moderation invigorates the system and exhilirates the spirits; if used too copiously, it is apt to occasion weakness, tremors, palsies, and evidently aggravates all nervous diseases. Coffee is said to be most salutary of all liquors if taken at meal times—a custom quite common on the continent. If taken an hour after dinner, it relieves nervous headache, and also a fit of the asthma. Cocoa or chocolate is very nutritious, when boiled with milk and eggs, and is a great use in debility, emaciation and consumption. The chief and evident rule in diete-

ticks, consists in moderation, for we observe that most diseases are relieved by depletion. The immortal Hippocrates recommended "that a person "in health should never take food to satiety." "Plato said that intemperance was the nurse "of physicians, and that the stomach destroyed "more than the sword;" while Galen asserted, "that the antients laboured under fewer diseases, "because they lived more frugally than the peo- "ple of his time." Nothing is of more importance to the bilious or dyspeptic, than the proper and complete mastication of the food, which will render it more subject to the solvent powers of the stomach. Late suppers should be always avoided, and if taken, these persons should prefer lying on the right side in bed, for thus the contents of the stomach will readily pass on to the intestinal canal—whereas if a person lie on the left side the contents of the stomach must rise against their own gravity to pass on through their natural course. Then distention of the stomach will prevent the full expansion of the lungs, the breathing becomes laborious and interrupted with a sense of suffocation and weight on the chest called nightmare, and the patient awakes from troubled sleep with violent palpitations, and often with great agitation from terrific dreams. With respect to the medical treatment of dyspepsia, it must be so varied that the enumeration of so many remedies would be impracticable in this place; and it is also so well known to the profession, that further notice of it here is unnecessary. I may observe that this disorder is greatly relieved by chalybeate waters.

This class of Mineral Waters has been found useful in many female complaints, where the periodical evacuation is obstructed or immoderately increased. In the former case, when the patient is affected with sluggishness, lassitude and debi-

lity, and with various symptoms of indigestion; where the face loses its florid colour, and becomes pale and flaccid, the breathing being much hurried by quick motion, the patient being liable to palpitation and fainting; when these symptoms are attended with pain in the head and back, there can be little doubt but the suppression depends upon general laxity or weakness of the constitution, in such cases ferruginous waters produce wonderful strength and restore vigour to the languid vessels, and enable them to overcome the obstruction. When excessive menstruation depends on relaxation and debility, chalybeate waters are useful, but if dependant on the fulness of the system in robust habits, they would be highly injurious. In the disease named fluor albus, which is generally induced by debility and often succeeds the last described complaint, these waters are very beneficial.*

They are highly serviceable in chlorosis, sterility, stone, gravel, diseases of the kidney and its appendages, in pain of the stomach from gallstones, heartburn, waterbrash, dropsy, when induced by obstruction in the liver, jaundice, worms, St. Vitus' dance, diseases of the skin, in delicacy and general debility. They are improper in diseases of the lungs, heart, brain, in habits predisposed to apoplexy, or determination of blood to the head, unless previously prepared for them by medicine. Chalybeate Waters induce giddiness, headache, somnolency, nausea and vomiting, which are mostly transient and disappear in a day or two, and if not obstinate, should not be interfered with. A mild aperient, as epsom salts, or magnesia, generally removes them. Mineral Waters have thus been employed in a vast number of diseases, after

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* For very valuable information on this subject, see Clarke on Female Diseases, Part II, 1822.

the convalescence of putrid, typhus, nervous, bilious, intermittent, remittent, and in hectic fevers; also in bilious, nervous, calculous, vesical, hysterical and gouty diseases. After small-pox, chicken-pox, measles, scarlet fever, hæmorrhoids, spitting of blood, female complaints, amenorrhœa, menorrhagia, chlorosis, dyspepsia, waterbrash, pain in the stomach, heartburn in apoplexy, palsy, chorea, epilepsy, asthma, dyspnæa, diabetes, melancholy, atrophy in dropsies, scrofula, cutaneous diseases, and against worms.

The quantity which is usually taken of each Mineral Water, must be known at the Spa, and must be so varied that it becomes absolutely necessary to apply to a resident Physician for safe and proper directions:—But I may generally observe that pure air, temperate living, early and regular hours, active diversions, agreeable company, and relaxation from business, should be observed during the use of Mineral Waters.

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